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Six Afterthoughts: Comments on "Varieties of Intellectual Talent"

Though Professor Stanley and I come from distinctly different scientific traditions, I find myself in considerable sympathy with his review. I endorse his historical perspective, his recognition of the strengths and limitations of the psychometric approach, his skepticism about IQ and "g" as sufficient to account for extraordinary human accomplishments. His focus on differential aptitudes is consonant with my own belief in multiple intelligences (Gardner, 1993a). His work on the identification and long-term follow-up of mathematically precocious youth is remarkable and will take pride of place in future annals that chronicle this domain of investigation. I must also applaud his modest tone. He recognizes that we are still in the early stages of our understanding of these complex domains. His humility in the face of the phenomena and the data of giftedness stands in admirable contrast to the overblown rhetoric to which we have become accustomed in this era of *The Bell Curve* (Herrnstein and Murray, 1994).

Rather than quibble with (or further applaud) specific points, I would like to use this occasion to mention six thoughts which were stimulated by my study of this paper.

1. **Further distinctions.** In my own work I have found it useful to distinguish among five forms of exceptional promise and achievement. *Intelligence*, whether one adopts a unitary or pluralistic perspective, involves the ability to solve problems and/or to fashion products that are valued in one or more cultural settings. People differ in their intellectual potentials and achievements, for many reasons.

In *creativity*, the emphasis falls on coming up with solutions (or products or works or questions) that are novel, but which sooner or later are accepted as genuine additions to a domain. An individual may be highly creative without being especially intelligent. More important, an individual may exhibit the highest intelligence without showing the slightest ability or inclination to be creative.

We speak of *expertise* when an individual is able to achieve a high level of performance in a domain. Expertise generally is thought to reflect the amount of practice carried out by an individual. High intelligence or high creativity may be neither necessary nor sufficient for the attainment of expertise.

In our celebrity-oriented society, we encounter all too many examples of *success*. Success is measured solely by the amount of acclaim received by an individual — it is a reflection of the market alone. Individuals may achieve much success by virtue of intelligence, expertise, creativity, misfortune, luck, or any combination thereof. One can tell only in retrospect whether an individual crowned by success is also creative.

Finally, I think it is worth demarking an area termed *genius*. I reserve this term for the works of individuals (or, rarely, of groups) that discover or produce fundamental truths about the world — truths that add to the sum of human knowledge and can be appreciated universally. One may attain genius in the arts or in the sciences, but geniuses are quite rare, as Gardner (1993b), among others, has shown.

2) **The roles of domain and field.** There has been a tendency in the study of giftedness to treat gifts as if they exist in the mind — possibly from birth — in immaculate disconnection with the rest of the world. A person is seen as gifted or intelligent or creative, without modification.

A new line of research (Feldman, Csikszentmihalyi, and Gardner, 1994) throws this perspective into doubt. Whatever the facts of the biological matter, it makes no sense to consider achievements apart from the existence in a society of two elements: (1) different *domains* or spheres of human accomplishment; (2) *fields* of human beings and institutions that make judgments about quality. Even the simplest items on an intelligence test are drawn from domains of practice within a given culture (vocabulary use, completing a jigsaw puzzle) and included only because, in the view of experts, they represent proper samplings of a domain called intellect. And when one attends to issues of creativity, it makes little sense to think of human production apart from the domains in which it can take place and the individuals who make tentative and ultimate judgments about uniqueness and appropriateness.

3) **The ubiquity of environmental and cultural factors.** As the author wisely notes at the beginning of his essay, environmental factors begin to interact with genetic ones from the moment of conception. Discussion of "pure" genetic or "pure" hereditary or "pure" environmental factors simply does not make sense from a contemporary biological perspective. By the time an individual can take a standard intelligence test, he or she has already been exposed to many thousands of environmental events that have affected competence as well as self-concept. Any discussion of individual or group differences must take this fact into account.

I find it useful to contrast two youngsters, one raised in a benevolent environment, the second in a punishing one. Suppose that child A has undergone twenty positive environmental experiences per day (ones that are physically or psychologically strengthening), while child B has undergone twenty negative experiences each day. By the time of birth, the box score is 5400 positive events for child A, 5400 negative events for child B. By the age of five, child A has had over 30,000 positive events, child B has had over 30,000 negative events. One cannot possibly interpret differences in performance on any psychometric measure without taking these radically different life experiences into account.

4) **Cross-cultural conceptions.** Again, just as we tend to think of intelligence as something with which a person is born, we tend to regard our notions of extraordinariness as universal, rather than as a product of Western — indeed, in some instances, of recent American — history. In fact, however, attitudes toward giftedness differ widely across cultures. In Japan, for example, there is a strong tradition of denying (or radically minimizing) differences in abilities across youngsters. Practice is considered to be the crucial factor. If an individual does not perform well, he or she is thought to be insufficiently disciplined or motivated, rather than intellectually incapable (Stevenson and Stigler, 1992). When a Japanese individual feels that he can perform better than others, he is likely to hide this feeling (and possible fact) from the group (Hatano, 1995).

Even more dramatic differences are noted when one moves beyond modern industrial society. Anthropologist Mary Romero (1992) has studied conceptions of talent among the Keres group of the Pueblo Indians. These individuals do not have an explicit word for giftedness. But they do recognize four areas of individual strengths: language and story-telling; motor activity and creativity with the hands; knowledge and lore about the society; and humanistic qualities, such as compassion. When an individual possesses all of these characteristics, he or she is considered blessed or "an ideal citizen." The blessed person is expected to contribute to his or her community; that, indeed, is the mark of a blessed individual.

5) **Potential markers versus actual achievements.** Our concern with early identification has led to a prizing of tests that purport to indicate who is likely to attain great heights. But precocity is not the same as the capacity to achieve great heights; the race does not always go to the swiftest. Moreover, it is possible that those traits that differentiate youngsters from one another may not be those that prove most crucial for ultimate accomplishment. While it is notable that some youngsters can achieve a very high score on a mathematics examination like the SAT, this may not be the best marker for who will ultimately make important mathematical contributions. It might be that the future mathematician of distinction stands out because of her interest in knots, her ability to make up new games, or her curiosity about the history of mathematics.

For such reasons, I favor mechanisms that allow individuals to show what it is that they can already accomplish in a domain and to indicate what it is that they would like to accomplish, particularly if they were given additional (and often precious) resources. I am suspicious of measures that claim to be "proxies" for talent or potential, particularly when one can look directly at the "real accomplishment." But I quite agree with the author that we cannot afford to provide enrichment for selected individuals unless we have a motivated reason for doing so, and I do not endorse interpretations of the theory of multiple intelligences that claim that "everyone is gifted."

6) **Mathematics as a questionable model for other domains.** Having just criticized an excessive reliance on tests, I have to concede that well-designed standardized tests can provide reasonable measures for mathematical talent. One cannot score 600 on an SAT-M in middle school unless one has accomplished a lot in the area of mathematics; and high achievement, as the author has shown, is a good prognosticator of future accomplishment, at least to the level of the Ph.D.

Yet I caution against the ready adoption of mathematics as a model for other domains. First of all, more of the substance of mathematics (below the professional level) can be approached through short-answer instruments than is the case with most other subject matters and domains. Second, mathematics stands out from other domains in the extent to which it is sequential and cumulative. While there is an agreed-upon order of accomplishment in the early years of mathematics, no comparable consensus appears in other disciplinary areas, ranging from history to literature to science.

I note, in conclusion, that after many years of relative stagnation, the fields of intelligence, creativity, and giftedness have recently been rejuvenated. I am pleased to participate in a discipline that has progressed more in the last decade than it had in the previous half century. We have indeed gone beyond the giants of the past and are establishing promising new lines of investigation. In his paper, Dr. Stanley has proved a reliable guide to our past. Let me note that he has been instrumental as well in launching some of the most promising new lines of investigation.

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